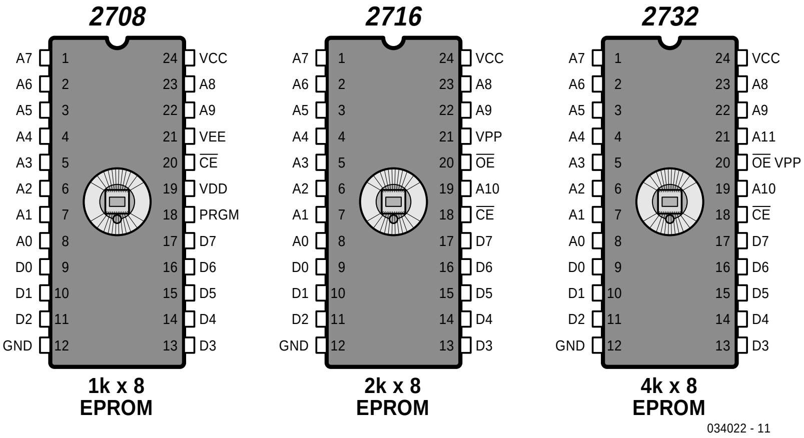
2708 Replacement

K. Walraven



At our editorial offices we are surprised (and delighted) how often we are being asked about relatively ancient circuits. In not a few cases, these circuits contain components that are currently no longer available, such as, for example, the 1 K size EPROM 2708, which required three(!) power supply voltages. The 2716 and 2732 are parts that are still reasonably easily obtained and programmed, and they also have 24 pins. These parts require only a single 5 V power supply.

Because the two additional power supplies of +12 V and –5 V are no longer required, these two pins have become available on the 2732 and 2716. But the 2716, being 2 K in size, needs an additional address line, of course, and the 2732 (4 K) needs two more. These extra address lines are simply connected to ground permanently, so that both the 2716 and 2732 behave lke a 1 K EPROM, just like the 2708.

Pin 19 (VDD on the 2708) became address line A10 on the 2716 and 2732. This line is connected straight to ground. Pin 21 (VBB on the 2708) became the programming pin on the 2716. In order to be able to read the EPROM, this pin must be connected to the +5 V power supply. On the 2732, this pin became address line A11, and therefore has to be connected to ground.

Unfortunately there have been additional changes to pins 20 ($\overline{CE}$, chip enable) and 18 (programming voltage). Pin 18 on the 2708 is the programming voltage but is the $\overline{CE}$ (chip-enable) on the 2716 and 2732. Pin 20 used to be $\overline{CE}$ on the 2708 but is $\overline{OE}$ (output enable) on the 2716 and 2732. The 2708 did not have an $\overline{OE}$ pin.

The simplest solution is as follows: continue to use pin 20 to enable the data output from the chip. This is possible because $\overline{CE}$ for the 2708 is now used as $\overline{OE}$ for the 2716 and 2732, provided pin 18 ($\overline{CE}$) is permanently connected to ground. This way, the chip is continuously selected, but the data only appears on the outputs when $\overline{OE}$ becomes active. The only disadvantage is that there is no reduction in current consumption.

We can imagine that you may have become a little confused after this long-winded story. Hence a set of foolproof instructions:

To replace a 2708 with a 2716:

1. Break the track to pin 18 and connect pin 18 to ground.
2. Break the track to pin 19 and connect pin 19 to ground.
3. Keep the connection to pin 20.
4. Break the track to pin 21 and connect pin 21 to +5 V.

To replace a 2708 with a 2732:

1. Break the track to pin 18 and connect pin 18 to ground.
2. Break the track to pin 19 and connect pin 19 to ground.
3. Keep the connection to pin 20.
4. Break the track to pin 21 and connect pin 21 to ground.

(034022-1)